

ABSTRACT

According to one exemplary embodiment, a method for forming a field-effect transistor on a substrate comprises a step of forming a buffer layer on the substrate, where the buffer layer comprises ALD silicon dioxide. The buffer layer can be formed
5 by utilizing a silicon tetrachloride precursor in an atomic layer deposition process, for example. The buffer layer comprises substantially no pin-hole defects and may have a thickness, for example, that is less than approximately 5.0 Angstroms. The method further comprises forming a high-k dielectric layer over the buffer layer. The high-k dielectric layer may be, for example, hafnium oxide, zirconium oxide, or aluminum
10 oxide. According to this exemplary embodiment, the method further comprises forming a gate electrode layer over the high-k dielectric layer. The gate electrode layer may be polycrystalline silicon, for example.

Figure 2 should accompany the Abstract.